

**CLAIMS**

- 1    1. A system comprising:
  - 2                a charge-emission device having an emitter; and
  - 3                a controllable current source electrically connected to the emitter
  - 4                of the charge-emission device by an electrical path, the controllable
  - 5                current source supplying to the emitter of the charge-emission device
  - 6                over the electrical path a controlled amount of electrical current that
  - 7                produces a potential difference at the emitter with respect to an electrode
  - 8                to induce the emitter to emit electrical charge.
- 9    2. The system of claim 1, further comprising a current sink connected to
- 10          the controllable current source for shunting at least a portion of the
- 11          electrical current to ground upon a detection of a particular charge
- 12          emission condition.
- 1    3. The system of claim 2, further comprising protection circuitry for
- 2          detecting the particular charge emission condition and for activating the
- 3          current sink upon the detection.
- 1    4. The system of claim 2, wherein the particular charge emission condition
- 2          is indicative of an excessive flow of current from the emitter.

- 1    5. The system of claim 2, wherein the particular charge emission condition
- 2        is indicative of an excessive rate of change of the current flowing from the
- 3        emitter.
  
- 1    6. The system of claim 1, wherein the current source is adjustable to enable
- 2        changes to an amount of electrical current being supplied by the
- 3        controllable current source to the emitter.
  
- 1    7. The system of claim 1, further comprising a controller directing the
- 2        controllable current source to provide a predetermined amount of
- 3        electrical current.
  
- 1    8. The system of claim 1, wherein the charge-emission device is a device
- 2        that emits ions.
  
- 1    9. The system of claim 8, wherein the emitted ions have a positive charge.
  
- 1    10. The system of claim 1, wherein the charge-emission device is a device
- 2        that emits electrons.
  
- 1    11. The system of claim 1, wherein the charge-emission device emits fluid.
  
- 1    12. The system of claim 1, wherein the charge-emission device is a gated
- 2        device.
  
- 1    13. The system of claim 1, wherein the charge-emission device has an array
- 2        of emitters including the emitter and a second emitter, and the

3        controllable current source provides current to each emitter in the  
4        emitter array.

1    14. The system of claim 1, wherein the controllable current source is a first  
2        current source, the charge-emission device has an array of emitters  
3        including a first emitter and a second emitter, and further comprising a  
4        second controllable current source, the first current source supplying a  
5        first controlled amount of electrical current to the first emitter and the  
6        second current source supplying a second controlled amount of current  
7        to the second emitter.

1    15. A system comprising:  
2                a micro-fabricated charge-emission device having an emitter; and  
3                controllable means for supplying to the emitter of the charge-  
4        emission device a controlled amount of electrical current that produces a  
5        potential difference at the emitter with respect to an electrode to induce  
6        the emitter to emit electrical charge.

1    16. The system of claim 15, further comprising means for signaling the  
2        supplying means to supply the controlled amount of electrical current.

1    17. The system of claim 15, further comprising means for adjusting the  
2        controlled amount of electrical current supplied to the emitter.

- 1    18. The system of claim 15, further comprising means for shunting at least a
- 2               portion of the supplied electrical current to ground upon a detection of a
- 3               particular condition.
- 1    19. The system of claim 15, further comprising means for detecting a
- 2               particular charge emission condition.
- 1    20. A method of controlling an amount of charge emitted by a charge-
- 2               emission device, the method comprising:
  - 3               supplying a controlled amount of current from a controllable
  - 4               current source to an emitter of a charge-emission device over an
  - 5               electrical path; and
  - 6               emitting charge from the emitter of the charge-emission device in
  - 7               response to the current received from the controllable current source.
- 1    21. The method of claim 20, further comprising adjusting the amount of
- 2               electrical current supplied to the emitter by the controlled current
- 3               source.
- 1    22. The method of claim 20, further comprising shunting the current
- 2               supplied by the controlled current source to ground upon a detection of a
- 3               particular charge emission condition.

- 1    23. The method of claim 20, further comprising shunting the supplied
- 2                 current in response to detecting an excessive rate of change in an
- 3                 amount of charge being emitted by the emitter.
  
- 1    24. The method of claim 20, further comprising shunting the supplied
- 2                 electrical current in response to detecting an excessive amount of charge
- 3                 being emitted by the emitter.